

Fig.2

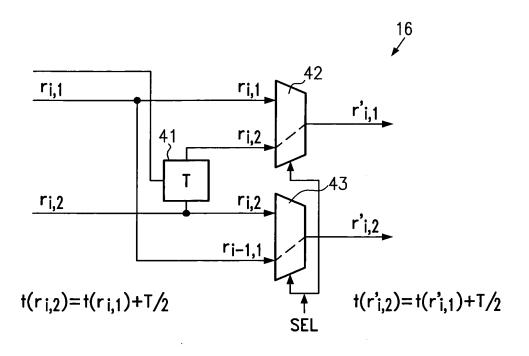
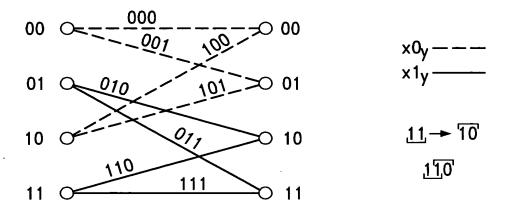
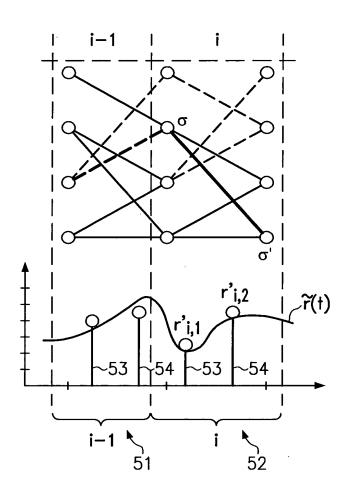


Fig.3



ISI-Trellis, M=2

Fig.4



<u>Brauch-Metric</u>

$$\begin{split} &\mathrm{BM}_{\mathrm{tot}}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) = \mathrm{BM}(\underline{\mathbf{b}},\mathbf{r}_{1}) + \mathrm{BM}(\underline{\mathbf{b}},\mathbf{r}_{2}) \\ &\mathrm{BM}_{\mathrm{tot}}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) = \mathrm{BM}_{1}(\underline{\mathbf{b}},\mathbf{r}_{1}) + \mathrm{BM}_{2}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) \\ &\mathrm{BM}_{\mathrm{tot}}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) = \mathrm{BM}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) \\ &\mathrm{BM}_{\mathrm{tot}}(\underline{\mathbf{b}},\mathbf{r}_{1},\mathbf{r}_{2}) = \mathrm{BM}_{1}(\underline{\mathbf{b}},\mathbf{r}_{1}) + \mathrm{BM}_{2}(\underline{\mathbf{b}},\mathbf{R}(\mathbf{r}_{1}),\mathbf{r}_{2}) \end{split}$$

Fig.5

		6	1								
channel state <u>b</u>	quantized data r ₁ or r ₂										
	0	1	2	3	4	5	6	7			
<u>b</u> (0)=000	f(0,0)	f(0,1)	f(0,2)	f(0,3)	f(0,4)	f(0,5)	f(0,6)	f(0,7)			
<u>b</u> (1)=001	f(1,0)	f(1,1)	f(1,2)	f(1,3)	f(1,4)	f(1,5)	f(1,6)	f(1,7)			
<u>b</u> (2)=010	f(2,0)	f(2,1)	f(2,2)	f(2,3)	f(2,4)	f(2,5)	f(2,6)	f(2,7)			
<u>b</u> (3)=011	f(3,0)	f(3,1)	f(3,2)	f(3,3)	f(3,4)	f(3,5)	f(3,6)	f(3,7)			
<u>b</u> (4)=100	f(4,0)	f(4,1)	f(4,2)	f(4,3)	f(4,4)	f(4,5)	f(4,6)	f(4,7)			
<u>b</u> (5)=101	f(5,0)	f(5,1)	f(5,2)	f(5,3)	f(5,4)	f(5,5)	f(5,6)	f(5,7)			
<u>b</u> (6)=110	f(6,0)	f(6,1)	f(6,2)	f(6,3)	f(6,4)	f(6,5)	f(6,6)	f(6,7)			
<u>b</u> (7)=111	f(7,0)	f(7,1)	f(7,2)	f(7,3)	f(7,4)	f(7,5)	f(7,6)	f(7,7)			
	6	52		- 63							

Fig.6

61												
channel state b	quantized data r ₁ or r ₂											
State <u>D</u>	0	1	2	3	4	5	6	7				
<u>b</u> (0)	BM(0,0)	BM(0,1)	BM(0,2)	BM(0,3)	BM(0,4)	BM(0,5)	BM(0,6)	BM(0,7)				
<u>b</u> (1)	BM(1,0)	BM(1,1)	BM(1,2)	BM(1,3)	BM(1,4)	BM(1,5)	BM(1,6)	BM(1,7)				
<u>b</u> (2)	BM(2,0)	BM(2,1)	BM(2,2)	BM(2,3)	BM(2,4)	BM(2,5)	BM(2,6)	BM(2,7)				
<u>b</u> (3)	BM(3,0)	BM(3,1)	BM(3,2)	BM(3,3)	BM(3,4)	BM(3,5)	BM(3,6)	BM(3,7)				
<u>b</u> (4)	BM(4,0)	BM(4,1)	BM(4,2)	BM(4,3)	BM(4,4)	BM(4,5)	BM(4,6)	BM(4,7)				
<u>b</u> (5)	BM(5,0)	BM(5,1)	BM(5,2)	BM(5,3)	BM(5,4)	BM(5,5)	BM(5,6)	BM(5,7)				
<u>b</u> (6)	BM(6,0)	BM(6,1)	BM(6,2)	BM(6,3)	BM(6,4)	BM(6,5)	BM(6,6)	BM(6,7)				
<u>b</u> (7) /	BM(7,0)	BM(7,1)	BM(7,2)	BM(7,3)	BM(7,4)	BM(7,5)	BM(7,6)	BM(7,7)				
	6	2										
							 64					

 $\mathrm{BM}_{tot}\left(\underline{\textbf{b}},\!r_1,\!r_2\right) = \mathrm{BM}(\underline{\textbf{b}},\!r_1)\!\!+\!\!\mathrm{BM}(\underline{\textbf{b}},\!r_2)$

Fig.7

				65	_					
channel s	state <u>b</u>	e b quantized data r ₁								
		0		•••	r ₁		•••	7		
<u>b</u> ₀ =0	000 BM ₁ 6		(0,0))	BM ₁ (0,r ₁))	BM ₁ (0,7)		
• • • •			•					•••		
<u>b</u> s		BM ₁	(s,0)	•••	$BM_1(s,r_1)$)	BM ₁ (s,7)		
•••			•		•••			•••		
$\mathbf{b}_{7} = 1$	11 /	BM_1	(7,0)		BM ₁	$/7,r_1$)	$BM_1(7,7)$		
Fig.8 62 67 66										
channel	qua	uantized data r ₂ , BM ₂ conditioned on r ₁ =1								
state b	0	\		r ₂	r ₂				$\frac{1}{1}$	
<u>b</u> 0=000	BM ₂ (0),r ₁ ,0)		BM ₂ (0,	$BM_2(0,r_1,r_2)$.		BM ₂ (0	,r ₁ , 7)		
•••		•		• • •						
$\underline{\mathbf{b}}_{\mathrm{S}}$	BM ₂ (s	M ₂ (s,r ₁ ,0) E			$BM_2(s,r_1,r_2)$		BM ₂ (s	$(\mathbf{r}_1, 7)$		
•••		•		• • •	•••		• •			
$\underline{\mathbf{b}}_7 = 1 \frac{1}{1}$	$ BM_2(7,r_1,0) \dots BM_2(7,r_1,r_2) \dots BM_2(7,r_1,7) $									
62 68										
$BM_{tot}(\underline{\boldsymbol{b}},r)$	$(r_1, r_2) = I$	ВМ ₁ (<u>в</u>	,r ₁)	+ BM ₂ (b ,r ₁ ,r ₂)		69		

Fig.9

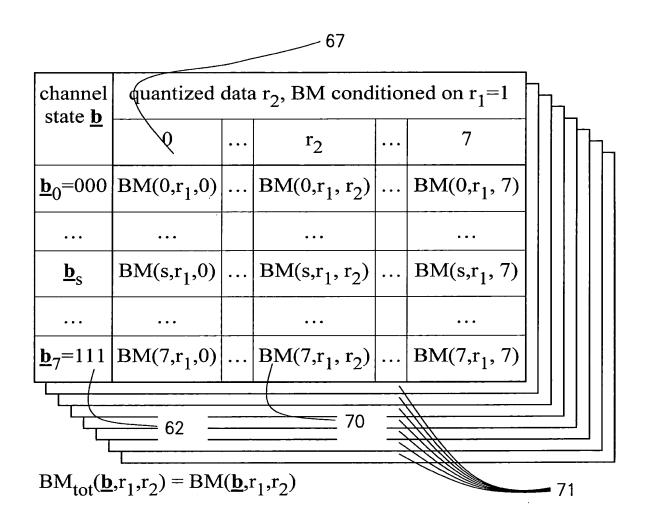


Fig.10

			67					
channel state b	quantized data r_2 , BM ₂ conditioned on R(r_1)=1							
1	Q	•••	r ₂		7			
b ₀ =000	$BM_2(0,R(r_1),0)$		$BM_2(0,R(r_1),r_2)$		$BM_2(0,R(r_1),7)$			
•••	•••		•••					
$\underline{\mathbf{b}}_{\mathrm{S}}$	$BM_2(s,R(r_1),0)$	•••	$BM_2(s,R(r_1),r_2)$		$\left BM_2(s,R(r_1),7) \right $			
•••	•••		•••					
b ₇ =111	$BM_2(7,R(r_1),0)$	•••	$BM_2(7,R(r_1),r_2)$	•••	$BM_2(7,R(r_1),7)$			
62 72								
			73					

 $\mathrm{BM}_{tot}(\underline{\textbf{b}},\mathsf{r}_1,\mathsf{r}_2) = \mathrm{BM}_1(\underline{\textbf{b}},\mathsf{r}_1) + \mathrm{BM}_2(\underline{\textbf{b}},\mathsf{R}(\mathsf{r}_1),\mathsf{r}_2)$

Fig.11

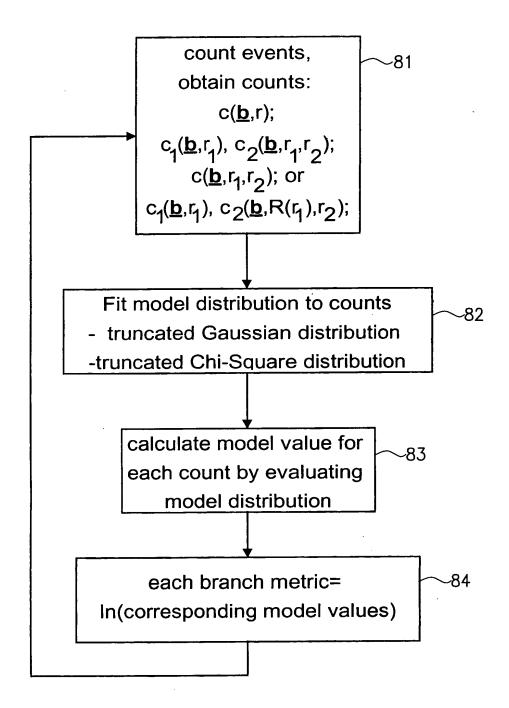


Fig.12

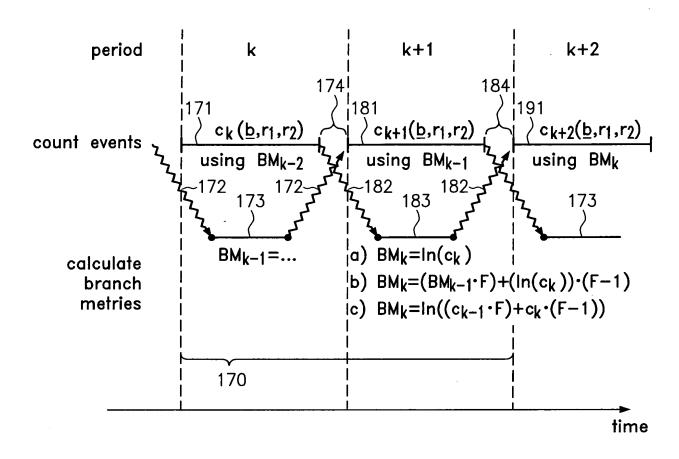
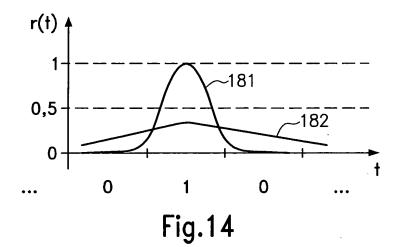
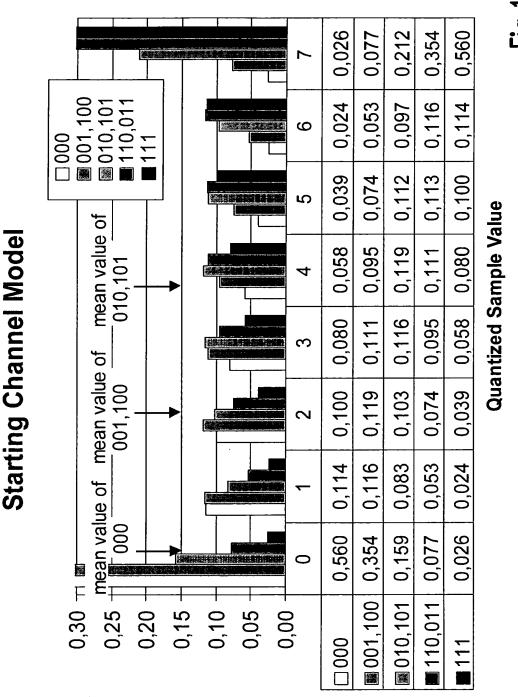


Fig.13





Relative Frequency

Fig.15

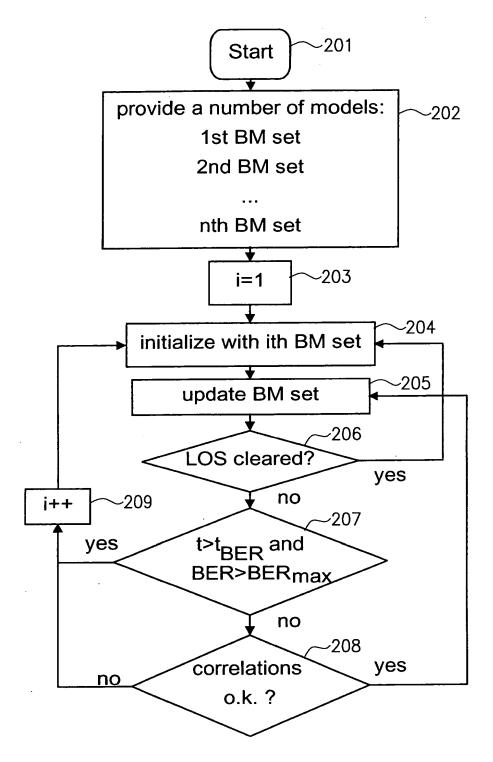


Fig.16

